

What is claimed is:

1. A magnetic induction time-multiplexed two-way short-range wireless communications system, comprising:

- a first unit for receiving first unit input signals and providing first unit output signals, the first unit including
 - a first unit transducer system for generating a first inductive field based upon the first unit input signals during a first time slot and for receiving a second inductive field during a second time slot, the first unit transducer system comprising at least one transducer,
 - a first unit processing circuit for modulating the first unit input signals during the first time slot, driving the at least one transducer with the modulated first unit input signals during the first time slot to cause the at least one transducer to generate the first inductive field, and receiving and demodulating the second inductive field to produce the first unit output signals during the second time slot, and
 - a first unit interface circuit for matching the first unit transducer system to the first unit processing circuit; and
- a second unit for receiving second unit input signals and providing second unit output signals, the second unit including
 - a second unit transducer system for generating the second inductive field based upon the second unit input signals during the second time slot and for

receiving the first inductive field during the first time slot, the second unit transducer system comprising at least three transducers wherein each of the at least three transducers is arranged orthogonally with respect to the other transducers,

- a second unit processing circuit for modulating the second unit input signals during the second time slot, driving one of the at least three orthogonal transducers with the modulated second unit input signals during the second time slot to cause the one of the at least three orthogonal transducers to generate the second inductive field, and receiving and demodulating the first inductive field to produce the second unit output signals during the first time slot,
 - a second unit interface circuit for matching the second unit transducer system to the second unit processing circuit, and
 - a second unit switch network for coupling one of the at least three orthogonal transducers to the second unit interface circuit.
2. The system of claim 1 wherein the first unit transducer system comprises a single transducer.
3. The system of claim 2 wherein the single transducer comprises a rod antenna.
4. The system of claim 1 wherein each of the at least three orthogonal transducers of the second unit transducer system comprises a rod antenna.

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